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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,790	10/16/2003	Hirofumi Watatani	032015	7016

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EXAMINER

CHEN, KIN-CHAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/685,790

Applicant(s)

WATATANI, HIROFUMI

Examiner

Kin-Chan Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-15 is/are allowed.
- 6) ☒ Claim(s) 1-10, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art (JP 2000-195791) in view of Liu et al (US 6,117,345; hereinafter "Liu").

In a method for semiconductor device fabrication, the admitted prior art (page 3 of the specification; Fig. 4B; also JP 2000-195791) teaches that an interlayer insulating film may be formed on a surface of a substrate having an insulating surface, formed with semiconductor elements, and having a conductive member exposed in a area of the insulating surface. A first antireflection film may be formed on a surface of an underlying substrate. The first antireflection film may suppression reflection in an absorption mode. A second antireflection film may be formed on the first antireflection film. The second antireflection film may suppress reflection in a countervailing interference mode, and made of a same material as the first antireflection film (e.g., SiON). See JP2000-195791, [0009] [0020], [0032]). A photosensitive resist film may be

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formed thereon. A latent image may be formed in the photosensitive resist film by exposing the photosensitive resist film to light having a first wavelength. The exposed photosensitive resist film may be developed to form an opening through the first photosensitive resist. The interlayer insulating film may be etched by using the first photosensitive resist film as a mask.

Unlike the claimed invention, the admitted prior art does not teach a cap film may be formed on the second antireflection film. In the method for forming wiring structure, Liu teaches that a cap layer may be formed over an antireflection layer (so-called protective layer in Liu) for the purpose of absorbing the light, col. 7, lines 11-16, 19-21, and 64-65. The cap layer may serve as a hardmask as well as a second antireflection layer which created destructive interference to prevent light from reflecting (col. 7, lines 58-67). The cap layer may be used to reduce the contamination when the photoresist is removed (col. 8, lines 33-47). Hence, it would have been obvious to one with ordinary skill in the art to use the cap layer as disclosed by Liu in the process of admitted prior art because Liu teaches that to do so would reduce the contamination when the photoresist is removed.

Dependent claims 2-5 and 7-10 differ from the combined prior art by specifying various attenuation coefficients of cap film, first antireflection film, and second antireflection film. However, since the combined prior art has the same functions and serves same purposes (such as reducing the contamination while removing the photoresist, suppression reflection in an absorption mode, suppression reflection in an interference mode), it would have been obvious to one with ordinary skill in the art to adjust various attenuation coefficients of cap film, first antireflection film, and second

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film because same are merely a matter of choices of design depending on the specific product requirements.

***Response to Arguments***

3. Applicant's arguments filed August 16, 2005 have been fully considered but they are not persuasive.

Applicant has argued that JP2000-195791 does not teach that the second antireflection film is made of a same material as the first antireflection film. It is not persuasive. As has been stated in the office action, JP2000-195791 teaches that the second antireflection film may be made of a same material as the first antireflection film (e.g., SiON). See JP2000-195791, [0009] [0020], [0032]), also English translation (by computer) of JP2000-195791 is attached for reference.

***Allowable Subject Matter***

4. Claims 11-15 are allowed.

The following is an examiner's statement of reasons for allowance:

The references of record do not teach or suggest a method comprising:

Removing the first photosensitive resist film; forming a second photosensitive resist film on the cap film; forming an opening through the second photosensitive resist, the opening corresponding to the wiring pattern to be formed on the interlayer insulating film, etching the interlayer insulating film to form a wiring groove by using the second photosensitive resist film as a mask.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an

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application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*September 22, 2005*

Kin-Chan Chen  
Primary Examiner  
Art Unit 1765